

### ABSTRACT OF THE DISCLOSURE

The invention provides amyloid beta-derived dementing ligands (ADDLs) that comprise amyloid  $\beta$  protein assembled into globular non-fibrillar oligomeric structures capable of activating specific cellular processes. The invention also provides methods for assaying the formation, presence, receptor protein binding and cellular activity of ADDLs, as well as compounds that block the formation or activity of ADDLs, and methods of identifying such compounds. The invention further provides methods of using ADDLs, and modulating ADDL formation and/or activity, *inter alia* in the treatment of learning and/or memory disorders.

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